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Spin fluctuations in a magnetically frustrated metal, LiV_2O_4*

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Using inelastic neutron scattering we have studied spin fluctuations in the d-electron heavy fermion spinel LiV_2O_4. The spin relaxation rate, Γ_Q, for $Q = 0.6$ Å^{-1} has a residual value of 1.5(1) meV at low temperatures and increases linearly with temperature at a rate of 0.41(4) k_B. There is antiferromagnetic short range order at low temperatures with a characteristic wave vector $Q_c = 0.64(2)$ Å^{-1} and a correlation length of 6(1) Å. Sum rule of the low temperature data yields only 40% of the total scattering from the effective moment inferred from high temperature susceptibility measurements. The results are discussed in the context of conventional heavy fermion systems, geometrically frustrated insulating magnets, and recent theories for LiV_2O_4.

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